IN THE SPECIFICATION

Please replace the paragraph beginning at page 7, line 19, with the following rewritten paragraph:

As a typical example, the thickness of each layer was chosen as Cu (10nm) / ferromagnetic layer (4.5nm) / Cu (2nm) / ferromagnetic layer (4.5nm) / antiferromagnetic layer (10nm) / Cu (10nm). The two magnetic layers were assumed to have the same thicknesses. Two CC-layers of a 0.5 nm thick insulator with a slit having a width of 0.5 nm running from the bottom to the top in the height direction were inserted by replacing a part of the above structure leaving the same materials in the slits. The element size was assumed to be 40 nm x 40 nm. The correspondence between the location numbers in the y direction and the layer materials are listed in Table 1. In the simulation, Mott's two-current model for the electrical conductivity in ~~metals [1, 2] was~~ metals was adopted. See N. F. Mott, "The Resistance and Thermoelectric Properties of the Transition Metals," Proceedings of the Royal Security of London, Series A. Vol. 156, 368-382 (1936), and S. F. Lee, W. P. Pratt, Jr., Q. Yang, P. Holody, R. Loloee, P. A. Schroeder and J. Bass, "Two-channel analysis of CPP-MR data for Ag/Co and AgSn/Co multilayers", J. Magn. Magn. Mater., Vol. 118, L1-L5 (1993). The numbers on the horizontal and vertical axes in Fig. 3(a), 3(b), and 3(c) indicate the location of the CC-layers 1 and 2, respectively. The symbols Cu, F, and AF on the right side and above of the mappings denote the locations of the copper, ferromagnetic, and antiferromagnetic layers, respectively.

Please replace the paragraph beginning at page 9, line 8, with the following rewritten paragraph:

Here, the bulk spin asymmetry coefficient, β, of 0.58 and the interface spin asymmetry coefficient, γ, of 0.34 were assumed in accordance with the experimental results of Oshima et al., with β denoting $1\text{-}2\rho/\rho_H = 2\rho/\rho_L\text{-}1$, where ρ is the resistivity of said ferromagnetic layer

material, ρ_L is the resistivity of the ferromagnetic layer material for the low resistivity channel, ρ_H is the resistivity of the ferromagnetic layer material for the high resistivity channel, and γ denoting $1\text{-}2RA/R_HA = 2RA/R_LA\text{-}1$, where RA is the resistance area product of the interface between the ferromagnetic layer and the Cu ~~layers~~ layer, R_LA is the resistance area product of the interface between the ferromagnetic layer and the Cu layer for the low resistivity channel, and R_HA is the resistance area product of the interface between the ferromagnetic layer and the Cu layer for the high resistivity channel. As for those formulas, for instance, see the Valet et al. publication. It is clearly seen in Figs. 3(a) to 3(c) that the total resistance R_P, the magnetoresistance ΔR, and the GMR ratio are enhanced substantially when each of the two CC-layers is located on a different side of the center of the conducting spacer (in this example the Cu-layer between the two ferromagnetic layers, one corresponding to a free layer and the other to a pinned layer). This is especially true when each of the two CC-layers is within and/or in the vicinity of the ferromagnetic layers, and more prominently when they are within the ferromagnetic layers. This effect is remarkable compared to the case where only one CC-layer is inserted, which is represented by the results plotted along the diagonal *d* in the figures. The features of the mappings shown above have been confirmed to be the features obtained not only for the particular parameters used in the above simulation, but also for other various combinations of parameters as will be described by the following.

Please replace the paragraph beginning at page 12, line 20, with the following rewritten paragraph:

Fig. 7 illustrates a schematic of an embodiment of the present invention. Elements ~~71 and 72~~ 71, 71' and 72, 72' are magnetic layer structures, either which is a free layer structure and the other is a pinned layer structure with a conducting spacer layer structure **73** and two CC-layer structures **74** and **74'** in between. Each layer structure has a width *w* and a height *h*.

Each of the CC-layer structures confines the current path from going from one side of the CC-layer structure to the other side of the CC-layer structure in order to increase the total resistance of the spin-valve element and to obtain high output voltage when a reasonable amount of current is applied to the spin-valve element perpendicular to the element layer structure. Each of the CC-layer structures **74** includes an insulator with a conducting part or a plurality of conducting parts. When the conducting part is a hole or a slit and one of the CC-layers is inserted between one of the magnetic layer structures ~~71 and 72~~ **71 and 72** and the conducting layer structure [[73]] **73**, one of the magnetic layer structures **71** and **72** and the conducting spacer layer structure **73** are directly connected to each other through the hole(s) or slit(s). Each of the CC-layer structures **74** and **74'** can be of a mosaic structure including at least two parts having significantly different conductivities. The spin valve element is connected to a current source from one side to the other through the leads **75** and **75'**. The pinned layer structure can be either a single ferromagnetic layer with a higher coercivity than the free layer, a ferromagnetic layer exchange coupled with an anti-ferromagnetic layer, or a sandwiched structure including (i) a ferromagnetic layer, (ii) a non-magnetic layer, and (iii) a ferromagnetic layer. The sandwiched structure is called a synthetic antiferromagnetic layer structure. One of the ferromagnetic layers of the synthetic antiferromagnetic layer is exchange coupled with an antiferromagnetic layer, or any modifications thereof.

Please replace the paragraph beginning at page 14, line 11, with the following rewritten paragraph:

Fig. 10 illustrates the dependence of the output voltage $\Delta V = \Delta R \times I$, wherein I is the sense current applied to the spin-valve element on the total conducting part width ~~for two~~ in a CC-layer for two spin-value structures with different type of CC-layer structures, one having only one conducting part and the other having a plurality of conducting parts. Both of the

CC-layer structures [[of]] are 1 nm ~~thickness for a spin-valve element as is shown in Fig. 9 with~~ thick having the same parameters as those shown in Table 2. One CC-layer structure has only one conducting part and the other CC-layer structure has a plurality of conducting parts. Each of the CC-layer structures of one of the spin-valve structures has only one conducting part and each of the CC-layer structures of the other spin-valve structure has a plurality of conducting parts. The width of each conducting part of the CC-layer for the latter spin-valve element was set at 0.5 nm and the total conducting part width was varied by varying the number of conducting parts. The applied current I was chosen so as to keep the current density at [[the ~~each~~]] the conducting part of each CC-layer equal to 100 MA/cm^2. It is seen that when the total width of the conducting part of the CC-layer for each spin-valve structure are equal to other, the former spin-valve structure gives much higher ΔV than the latter except on both extreme ends of the total width. That is, a single conducting part structure is preferable in order for the CC-layers to obtain higher ΔV for a conducting part having a predetermined total width than a structure where the conducting part is divided into multiple parts.